

REMARKS

Claims 21-24, 26-32, 41, and 50-62 are currently pending. By this amendment, Claims 21-23, 28, 29, 51, 54, 55, 60, and 61 have been amended, the second occurrence of Claim 52 has been canceled, Claim 53 has been canceled, and new Claims 63-69 have been added. Support for the amendment and new claims is found in the specification and claims as filed. Cancellation or amendment of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented, and Applicants reserve the ability to pursue the amended claims as filed, the canceled claims, or similar claims in one or more other applications, e.g., continuation, divisional, or continuation-in-part applications.

Claim Objection

Claims 52-62 have been objected to because of formalities, namely, the presence of two Claim 52s. The second occurrence of Claim 52 has been canceled. In view of the cancellation, Applicants respectfully request withdrawal of the objection.

Claim Rejections - 35 U.S.C. § 112, second paragraph

Claims 51-59 have been objected to as indefinite with respect to the limitation relating to positioning of the field effect transistor in Claim 51. Claim 51 has been amended to specify that the field effect transistor is attached gate side down to the bottom auxiliary layer. Support for the amendment is found in Fig. 2 of the specification as filed and the accompanying description. In view of the amendment, Applicants respectfully request withdrawal of the rejection.

Claim Rejection - 35 U.S.C. § 103(a) – Yousaf and Hollis

Claims 21-32, 41 and 50-59 have been rejected under 35 U.S.C. §103(a) as obvious over Yousaf et al. (PNAS, 2001) in view of Hollis et al. (U.S. 5,653,939). It is well settled that the Examiner “bears the initial burden of presenting a *prima facie* case of unpatentability...” *In re Sullivan*, 498 F.3d 1345 (Fed. Cir. 2007). Until the Examiner has established a *prima facie* case of obviousness, the Applicant need not present arguments or evidence of non-obviousness. To establish a *prima facie* case of obviousness, the Examiner must establish at least three elements. First, the prior art reference (or references when combined) must teach or suggest all of the claim limitations: “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 165 U.S.P.Q. 494, 496 (CCPA 1970); *see also M.P.E.P. § 2143.03*. Second, there must be a reasonable expectation of success. *In re*

Merck & Co., Inc., 800 F.2d 1091 (Fed. Cir. 1986); *see also* *M.P.E.P.* § 2143.02. And finally, the Examiner must articulate some reason to modify or combine the cited references that renders the claim obvious. Merely establishing that the claimed elements can be found in the prior art is not sufficient to establish a *prima facie* case of obviousness:

As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (emphasis added).

Instead, the Court has made clear that the Examiner must establish a reason one of skill in the art would have combined the elements of the prior art, and that such reason must be more than a conclusory statement that it would have been obvious.

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *See In re Kahn*, 441 F.3d 977, 988 (C.A.Fed.2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741 (2007).

Claim 21 as amended, from which the remaining rejected claims depend, recites “[a] sensing device for sensing a specific binding between an analyte and a recognition molecule, the sensing device comprising: a patterned, localized, and individually addressable microelectronic sensor, the sensor comprising: a solid substrate, a bottom auxiliary layer atop the solid substrate, an individually addressable activation element atop the bottom auxiliary layer, a top auxiliary layer atop the individually addressable activation element, an anchoring layer comprising electroactive moieties, wherein the anchoring layer is situated atop the top auxiliary layer, and wherein there is electrical access between the electroactive moieties and the individually addressable activation element, and a plurality of self-aligned recognition molecules covalently bound atop the anchoring layer, wherein the anchoring layer with the plurality of self-aligned recognition molecules covalently bound thereto comprises a sensor surface of the sensing device, wherein the individually addressable activation element is a thermal activation element configured to adjust a

temperature of a part of the anchoring layer and the anchoring layer's immediate surroundings by heating or cooling or is an electrochemical activation element configured to adjust an oxidation state of a part of the anchoring layer through a locally applied voltage or current, wherein the part of the anchoring layer has an area of less than 1 mm^2 , wherein a volume of the part of the anchoring layer's immediate surroundings, measured as extending into a space accessible by the recognition molecules, is less than 1 mm^3 , and wherein the sensor is configured to electrochemically detect a specific binding between the recognition molecules and an analyte."

Neither Yousaf nor Hollis teaches a sensor including the particular configuration of components as recited in Claim 21, namely, an individually addressable activation element situated underneath an anchoring layer, and between a top auxiliary layer and a bottom auxiliary layer. This particular configuration offers advantages including electrical access (e.g., an ohmic or diode-like contact) between the electroactive moieties and the individually addressable activation element (see, e.g., paragraph [0070] of the published application as filed). The various benefits of an activation element embedded in or positioned between auxiliary layers are set forth in paragraph [0071] of the published application as filed.

Accordingly, and for at least these reasons, Applicants respectfully submit that the pending claims as amended are not obvious under 35 U.S.C. § 103(a) and respectfully request that the rejection be withdrawn.

Claim Rejection - 35 U.S.C. §103(a) – Yousaf, Hollis, and Shin

Claims 60-62 have been rejected under 35 U.S.C. §103(a) as obvious over Yousaf in view of Hollis and further in view of Shin et al., Applied Surface Science 214 (2003) 214-221 ("Shin"). Applicants respectfully traverse this obviousness rejection. The limitations of Claim 21, from which the rejected claims depend, are set forth above, as are selected teachings of Yousaf and Hollis. As discussed above, Yousaf and Hollis do not teach or suggest, *inter alia*, a sensor having the particular configuration of components as recited in Claim 21. Shin includes no teachings overcoming this deficiency. Instead, Shin is cited merely for teaching tantalum pentoxide for use as a pH sensitive layer for an ISFET. Because Yousaf, Hollis, and Shin fail to teach or suggest all limitations of pending Claim 23, from which the rejected claims depend, a *prima facie* case of obviousness cannot be established. Accordingly, and for at least this reason, Applicants respectfully request that the rejection be withdrawn.

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Conclusion

Should the Examiner have any concerns that might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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